

Rising Tide of Innovation

Crane Serves as Illuminated Dock for Entrepreneurs

Driving through the expansive confines of southwest Indiana's Naval Surface Warfare Center – best known as Crane – exposes a civilian visitor to one of the Hoosier state's best kept secrets. While the necessary security checkpoints and restrictions may feel cumbersome at first, diving deep into the base reveals an underlying culture devoid of limitations, one full of opportunities for Indiana businesses and entrepreneurs.

One may wonder why the brains and hardware of the United States Navy resides in the hills and rolling pasture of Indiana. Crane Office of Engagement Director Brian Blackwell explains the base was created in 1941 to be intentionally distant from naval targets – an apropos idea considering its founding preceded one of America's darkest days.

"We started as an inland ammunition depot, commissioned in 1941 on the day before Pearl Harbor," he explains. "The notion was that the nation needed inland depots to store ammunition in case of an attack. The discipline we developed over the years in evaluating ammunition gave us the opportunity ... when electronic products were developed, we had the technical discipline to begin to work on them, and slowly migrated to electronics and microwave devices and subsystems and power systems and a whole host of new technologies built on that foundation."

Crane now pumps \$2 million per day into the Indiana economy – a number that includes employees' salaries and money going to Indiana firms on contract.

"We are now somewhere between a \$1.5 and \$2



Alexander Soles, Crane's 2012 Scientist/Engineer of the Year, describes Smartskin and its many practical uses.

billion per year enterprise," Blackwell quantifies.

Crane also houses 3,100 government staff, over 1,000 contractors and its Army partner has 800 employees. Its community totals somewhere between 5,000 and 6,000, and its payroll is \$450-475 million.

The 2005 Base Realignment and Closure Commission process (the latest in a series of reductions) had many concerned about Crane's future, but it was spared due to its economic impact on the region. Yet with federal defense cuts now looming, officials admit it remains critical for Crane to continue to maximize the talent and output of its brightest minds.

"Our demand is still strong, but sequestration is still a concern," Blackwell discloses. "It doesn't appear we'll be impacted as much as others, but it's tough to tell because we have so many customers. One thing it has done is slow down the dollars we'll be able to receive and that we're able to put out on contract. The funding flow that we're getting out is less and that could remain the case for a while."

For the people

Many think of war and its myriad machines and weaponry as tools of destruction. At Crane, however, those tools have become a means to bridge gaps between military efforts and taxpayers – and public and private arenas. In fact, the federal Stevenson-Wydler Technology Innovation Act of 1980, which was enacted to ensure that the citizenry benefits from federal research, serves as a basis for Crane's commitment to bring new technology and ideas to the country.

"Basically what that means is taxpayers have paid money into the federal government, research has occurred and technologies have been developed – and for the social economic well-being of the United States and the global market, it ought to be available to individuals and businesses in the country," clarifies John Dement, Crane's chief of technology transfer.

"We've taken that to heart in the last five years; we hired a patent attorney and a series of folks to work on technology transfer to try to make our technologies available. We're using a network across the state with economic development entities and universities to help assess, identify and get our technology in the hands of people who can do something with it."

According to Dement, the base is associated with 13 start-ups in the state.

"Some are people from inside the gate, some are

Battery Innovation Center a Sparkplug for State

Construction is under way for the Battery Innovation Center (BIC) – a business and concept accelerator located at Naval Surface Warfare Center (NSWC) Crane. Set to begin operations in July, BIC evolved from a Central Indiana Corporate Partnership (CICP) concept.

“(CICP) looked at the energy sector in Indiana and found a rich and strong heritage of research and development of infrastructure and intellectual capabilities of people here – they documented how robust it was,” relays BIC President Charles LaSota, who was a U.S. Navy captain and former commander of Crane.

He says Crane’s capabilities made the base an appropriate host for BIC’s 40,000-square-foot facility, namely because of its missions relating to power and energy.

“We looked for a location where we could have a lab to do collaborative research,” LaSota says. “So we came to NSWC Crane for a number of reasons. (There are) a number of leveraging capabilities and it was known up front that we wanted to provide to industry and Crane a set of capabilities that would be like none other in the United States.”

LaSota contends that federal labs, academia and industry are all doing this work, but not together in a tightly connected fashion – a problem BIC hopes to solve.

“We’re not synergized. We’re not leveraging the infrastructure, the people, the knowledge that we individually have to pursue a single road map to get us what we need.”

BIC’s work will include applied research, development, electronic control, low volume manufacturing, and field service and support.

The lab is funded by a consortium of dues-paying members, as well as public investment nationally and locally – including a \$15.6 million bond from Greene County.

“(The bond) will fund a turnkey lab that will provide all the capability and the equipment that’s needed so we can start that research and development this July,” LaSota relays. “We have great partners (including defense-oriented corporations across the country) and universities like Ivy Tech, Purdue and Penn State.”

Among other organizations, the Southern Indiana Development Commission and Radius Indiana – now led by former Lt. Gov. Becky Skillman – have also aided in

the process.

“We’ve created a BIC energy ecosystem for sustainable innovation with a pay-it-forward methodology,” LaSota asserts. “I don’t want a part of their company; I want them to be successful. And in the end as they’re out there creating more jobs, give me back the investment and maybe a little more so I can go out and help the next set of players.”

Importance of being there

The BIC’s existence will facilitate the development of ideas and products, many of which LaSota hopes will ultimately be manufactured in Southern Indiana.

“Crane has unique capabilities – they do environmental and abusive testing of energy systems to a degree that no one else does,” he adds. “They can take a large scale battery out and subject it to an oil fire and see what it does; they can shoot a nail through it; they can crush it. ... If you had a battery in your car, if the air bag saves your life, you don’t want to get killed by the battery.”

“Here we can provide a one-stop shop. We can do the prototyping, the performance testing ... to rapidly accelerate getting products into the market.”

LaSota asserts that following Crane’s lead and allowing innovators and manufacturers to develop products throughout the entire life cycle is critical to building entrepreneurship in the

state – and nation – and perhaps repositioning America’s standing in the global economy.

“(Crane) is there hand-in-hand,” he points out. “There are guys out on the battlefield in Iraq and Afghanistan looking at these systems. We need to take more of that philosophy in industry. Many times we take the short view and say, ‘They can manufacture this cheaper over in China. We’ll just let them do that.’”

“What you do there is cut your legs out from under you and compromise your future because the guy that’s going to come up with the next generation idea is the one working there on the production line – and sees where the improvements can be. You can’t divorce yourself from the manufacturing process.”

Resource: Charles LaSota, Battery Innovation Center, at www.bicindiana.com



Development of the Battery Innovation Center is nearly complete. Many people expect an abundance of big ideas to be cultivated within its walls.

outside – like students and faculty from universities. That's been one of the hottest beds for us," he offers. "They take our (intellectual property) and bring an ideation type process to it. University students come up with applications for our products that we would have never thought of in a million years. A lot of our licenses have come through applications that were on the peripheral of what it was intended for."

The 'skinny' on what's new

Dement points to Smartskin as a microcosm of the brainpower and innovation taking place at Crane today. The thin, flesh-like product was developed by a team of engineers (that includes Crane's 2012 Scientist/Engineer of the Year Alexander Soles) to examine and transmit specifics of structural damage to helicopters. It is being repurposed – at least in concept – with ideas from students from the University of Southern Indiana.

"One idea is bed sore monitoring – an innovative and effective way to monitor them. This is a multi-billion dollar industry, and it's growing," he elaborates. "The other (purpose) is structural monitoring of bridges."

Soles explains Smartskin's original use, walking through how Crane brings its products to the public.

"The problem we had was (damage to helicopters) in the ceramic armor," he discloses. "There were these microfissure cracks in them. Currently they have to throw them under an X-ray to look at them, so we thought, 'How can we press on, laminate, embed or print a series of structures onto that body armor to detect whether or not it's been compromised?' If you get shot at, you want to know that the armor protecting your rotor assembly is good."

Soles elaborated on the process of developing Smartskin.

"What we did was capture the (intellectual property) and proved out the technology to make sure that it worked – with a very small budget. One of the things this lab



Outdated weaponry and war relics can be found displayed around Crane. This tactical jamming System Pod was flown on the EA-6B and EA-18G aircrafts and was used to suppress enemy radar systems.

prides itself on is responsiveness and being quick and agile," he points out. "This was developed in a matter of months. We're trying to figure out where else in the market it can be used."

Crane has had interest from inside and outside the state. It has received different ideas for Smartskin applications.

"More people have been interested in this technology than any other we've had," Dement recalls. "It's simple enough that people can understand it. Not just monitoring body armor and steel on bridges, but automated target shooting, so people can shoot at a range and see an app on their smartphone showing where the target was hit."

Dement concludes that manufacturers and developers can now collaborate with Crane to bring products to market.

"They can pay (Soles) as a government employee, to customize this to do more prototyping, more piloting and focus on commercializing," he clarifies. "So we become a partner in taking this to another level of development. People can use these assets as a taxpayer to help them commercialize. We have the mechanisms to be able to do that."

Rising in the west

WestGate @ Crane, a technology park launched in 2007 and aptly named for its location, houses about a dozen companies that operate on more than 350 acres and boast over 500 employees. WestGate caters to a wide variety of firms, from established juggernauts to promising start-ups.

"There are some Fortune 100- or 200-level defense contractors that are currently here, and they are huge successes," explains executive director Don Schulte. "This academy is a major catalyst for the tech park, with 60,000 square feet and a conference center, which can hold over 800 people. It has a tremendously diverse capability for conferences and large meetings."

Science Applications International Corporation (SAIC), a large defense-oriented company with over 40,000 employees worldwide, has benefited greatly from the access to Crane's talent and capabilities.

"Because of our staff supporting Crane, a couple of years ago we were able to begin development and design of a waste-to-energy conversion mobile system, and it was state supported via a Department of Energy grant," says SAIC deputy operations manager Todd Plumer. "Using the folks we have here at Crane, we were able to use their know-how in developing the system. We now have completed our second system and hope we'll be producing some here soon and create more jobs in Southern Indiana."

Loogootee-based STIMULUS Engineering

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Crane

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is a small business that operates on the facility. It was named one of the Indiana Companies to Watch in 2011.

"STIMULUS is five or six years old, and we got our roots in Crane," relays Greg Oates, director of strategic programs. "Our two owners worked for years inside of Crane before starting the business. We provide engineering services in the main areas Crane has – (electronic warfare), radar, electro-optics. ... We try and do that on a strategic basis to help Crane and surrounding counties."

Schulte explains his vision for the near future includes making the facility a launching point for key technologies and developing an ecosystem of innovation. He plans to use the new Battery Innovation Center (see Page 19) as a catalyst and also hopes it becomes an instrument to enhance workforce development.

"There are opportunities for us to be a (workforce development) hub," Schulte believes. "Incentive packages are not going to land companies – it's workforce, and it needs to be matched with industry needs; K-12 (education) and community colleges need to be able to target and bring students and adults in and get them educated."

He says a conversation with the governor's office revealed that for every unemployed person in the state, there are more than two unfilled vacant jobs.

"The problem is a mismatch between the education system and what industries are looking for. I want us to help pilot initiatives to be able to move that forward," he projects. "We'll need to connect community learning centers and schools – and the ultimate goal is to get into the home. So we're looking into broadband (options)."

Schulte adds that challenges persist due to workforce issues and sequestration's possible impact on Crane-related work, but they can be overcome with a more regional approach.

"I believe our communities, especially in this part of Indiana, struggle to work regionally," he argues. "We'll need to get folks to look outside of just their town or county and realize we need to raise the water level in the lake to raise all boats higher."

Plumer adds that, contrary to what some may believe, attracting high level talent to WestGate is not a difficult task.

"The work that Crane has for a young engineer really sells itself," he qualifies. "We've had a lot of success recruiting from both coasts. You have to have that person who wants to be in this type of locale – but the combination of wanting to be away from the coast lifestyle and the work that is waiting for them here is appealing."

INFORMATION LINK

Resources: Brian Blackwell, John Dement and Alexander Soles, NSWC Crane, at www.navsea.navy.mil/nswc/crane

Greg Oates, STIMULUS Engineering, at www.stimulusengineering.com

Todd Plumer, Science Applications International Corporation, at www.saic.com

Don Schulte, WestGate @ Crane, at www.westgatecrane.com